Differences in Chronic Disease Prevalence, Knowledge, Behavior, and Self-Efficacy by Perceived Health Status in Food Pantry Clients

A Thesis Proposal

Presented to Graduate with Distinction from

School of Health and Rehabilitation Sciences of The Ohio State University

By

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Background and Problem Statement

Food insecurity is defined as the lack of resources to access sufficient, safe, and nutritious food (1). Between 2007 and 2008, the rate of food insecurity in the United States rose from 11.1% (13 million households) to 14.6% (17 million households). This estimate represents the highest food insecurity rate recorded since nationally representative food security surveys were established in 1995 (1). Indeed, food insecurity poses a significant public health concern that requires immediate attention. Yet, as evidenced by data reported in the 2010 Hunger in America Study, substantial barriers continue to exist in the acquisition and overall accessibility of healthy and fresh high quality foods in vulnerable populations. (2).

The poverty rate in Ohio has increased 42% in the last decade, and the state ranks eleventh in national food insecurity estimates (1,3). Like millions of Americans, impoverished Ohioans are becoming more reliant on emergency food assistance providers such as the Mid- Ohio Food Bank (MOF) and the 550 agencies it supports (2). In recent years, the MOF has partnered with OSU researchers to evaluate the impact of food on health disparities. Thirty- two percent of households served by the MOF report having at least one family member in poor health, and over 41% of MOF clients reported recently choosing between purchasing food and paying for medicine or medical care (2). Other studies have reported similar results that link inadequate or insufficient nutrient intake with poorer physical and mental health status (4,5).

Beyond the ability to access nutritious foods, addressing socioeconomic and psychosocial factors (self-efficacy, and self-perception) may provide insights into the motivation and health behaviors of food insecure adults. An individual's perceived ability and overall confidence to

carry out health recommendations influences health status. For instance, a person may have confidence in their ability for self-care, but lack the correct knowledge. Alternatively, a person may have the evidenced-based knowledge but elect not to adhere.

Related Research

Food insecurity is associated with health disparities, and it contributes to the prevalence of chronic disease in the United States (1). To restore domestic food security and to eliminate associated health disparities, it is important to understand key food-health relationships. Research has explored the influence of socioeconomic and psychosocial factors on health behavior (6–8). However, the effect of an individual's perception of their health status on chronic disease prevalence, knowledge, behavior and self-efficacy in food insecure populations has not been studied.

Obesity is unfortunately a common U.S. health condition characterized by a Body Mass Index (BMI) ≥ 30 which increases an individual's risk of developing of chronic disorders such as heart disease, cancer, and diabetes (9). Surprisingly, the highest rates of obesity are often found among populations with the highest levels of poverty (10). A cross-sectional study compared food assistance program participation (SNAP) with adiposity and metabolic syndrome risk factors in the 2003-2006 National Health and Nutrition Examination Survey (NHANES) cohort. This study found that the obesity levels were 58% higher in SNAP versus non- SNAP participants (11). Another study, conducted in rural Appalachian Ohio, revealed that BMI increased steadily as food security levels decreased. The association between food security and weight status was examined in a longitudinal cohort study of women living in 20 different U.S. cities between

2003-2005 (12). A significant association between food security level and weight status was found. In addition, various cross-sectional studies have demonstrated that obesity is more common in women than in men who live in food insecure households (13–15).

Excess body weight, metabolic syndrome, and ethnicity (African American, Hispanic, Asian, and Native American) are risk factors in the development of type 2 diabetes (DM). This chronic disease is prevalent in low-income populations. In food insecure populations, effective DM management is often compromised (16). In a national cohort of food insecure adults, a convenience sample of pantry shoppers (n=1,461) volunteered for acute blood glucose (BG) testing. Of this sample, 55% (n=796) exhibited BG> 200 mg/dL, suggesting the presence of diabetes. To confirm DM diagnosis, serum HgbA1C blood levels were taken. Nearly 71% (n=568) of those with acute BG>200 mg/dL, and 39% of the original sample (n=1,461) were living undiagnosed (Seligman, unpublished data). A landmark study suggests that the onset of DM occurs 9-12 years before clinical diagnosis (17). This research provides reason to believe that similar results would be found in the present study.

Many factors affect individuals' access to reliable health information. Literature suggests that level of education may impact an individual's knowledge of lifestyle recommendations that maintain optimal health (refs). Those with higher levels of education engage in more preventive and risk control behaviors (6). Yet some food insecure individuals have higher levels of education but may lack regular access to healthcare due to financial circumstances (Spees unpublished data). Limited access to primary healthcare providers may account for gaps in health knowledge. A study focusing on low-income African American showed that participants

obtained the majority of their health information from television shows (8).

The Health Belief Model suggests that perceived susceptibility, severity, benefits, and barriers influence behavior change (8). However, little data has been published in regards to perception susceptibility of health in low-income populations, and no literature was found that specifically examined the mechanisms of health perceptions in food insecure populations.

Self-efficacy is defined as the beliefs in one's capabilities to organize and execute the actions required to produce results (7). A secondary observational analysis of food insecurity and its association with DM self-management was examined in food insecure populations. Baseline food insecurity was analyzed in relation to changes in hemoglobin A1C (HbA1c) as well as self-reported DM self-efficacy. Data revealed that participants experiencing food insecurity had poorer DM-related measures at baseline but made significant improvements in overall self-efficacy (18). Examining chronic disease prevalence, knowledge, behavior, and self-efficacy by perceived health status may provide the necessary data to develop targeted interventions for health promotion in food insecure populations and those with chronic disease.

Study Objectives

Rates of food insecurity and chronic disease have concomitantly risen considerably in recent decades in the United States (1). Lifestyle behaviors associated with poverty may contribute to the rates of chronic disease, with the behaviors being influenced by subjective health status. Therefore, **the purpose of this study was to examine the relationship between perceived health status and factors that contribute to the reported health behaviors in food insecure**

adults living in Central Ohio. To assess this relationship, the following research questions were explored:

- What is the difference in the prevalence of chronic health conditions by perceived health status in adult pantry shoppers?
- What are the differences in self-efficacy in adult pantry shoppers by perceived health status?
- What are the differences by perceived health status in reported health knowledge and adoption of lifestyle factors related to diagnosed health condition among food insecure adults?

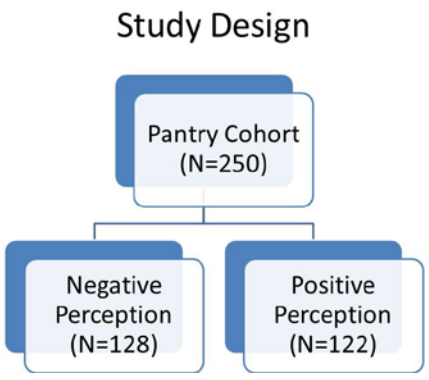
Methods

a. Population and Sample

Data from a convenience sample of food insecure adults was used to assess the relationship between perceived health status and factors that contribute to the development of health behavior. This pilot evaluated healthcare and healthcare access in food insecure adults in Central Ohio. The survey collected health and nutrition data of food insecure adults over a nine-month period in Franklin County. The survey included interviews regarding demographics, socioeconomic, dietary, and health related questions.

b. Data Collection and Preparation

A pilot study was completed in 2012 to conduct an in-depth needs assessment of local food insecure pantry shoppers. Specifically, the study was designed to collect data on food distribution patterns, client satisfaction, specific barriers to food and healthcare access, and nutrition knowledge related to chronic disease. Face-to-face interviews were conducted at five food pantries in Central Ohio. The survey also collected data about gender, age, race/ethnicity, education level, marital status, employment status, income, social service utilization, healthcare utilization, health conditions, barriers in food/health access, knowledge, self-efficacy, and pantry item preferences. Participants were asked, "In general, how would you describe your own health?" Those who responded "poor" or "fair" were classified as having a *negative perception* of their health, while those who responded "good", "very good" or "excellent" were classified as having a *positive perception* of their health.



Rates of chronic disease were assessed by self-report of previous diagnosis of obesity, diabetes, and cardiovascular disease by a healthcare provider.

Self-efficacy to perform healthy behaviors was measured by overall confidence in the ability to make decisions, treat conditions, manage, and change behavior in order to improve health. Those participants who reported a chronic condition (cardiovascular disease, diabetes, or obesity) were asked about their knowledge and behaviors related to that disease. See appendix for series of questions.

c. Instrumentation and Data Analysis

Data from the survey was analyzed for the total pantry participants and stratified by perceived health status pantry study. Frequency and Chi Square analyses were used to determine the differences in chronic disease prevalence, knowledge, behavior and self-efficacy by perceived health status. This data was tabulated for analysis using SPSS (version 20.0), with statistical significance determined using $\alpha<0.05$.

Facilities and/or Resources and Equipment Needed

The surveys were collected as part of a previous study assessing factors related to food insecurity in Central Ohio. Secondary data analysis was performed in Dr. Taylor's laboratory, which contains the software necessary to analyze the survey data.

Timeline:

Project Objectives and Tasks	Autumn	Winter	Spring
Data Preparation			
Access public use data files			
Training of software			
Data preparation			
Statistical Analysis			
Conduct analyses			
Generate tables			
Complete Thesis Document			
Develop results and discussion			
Present research at Ohio Dietetic Association and Denman			
Thesis defense			

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Presented impartial Fulfillment of the Requirements for Graduation with Distinction from the School of Health and Rehabilitation Sciences

By

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2014

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ABSTRACT

Objective: To assess the relationship between perceptions of positive versus negative health and medical conditions, self-efficacy, and lifestyle behaviors in a cohort of adult food pantry clients.

Design: Using data from a 2012-2013 voluntary survey that was designed using a mix of new and validated survey questions to assess demographics, perceived health status, preventive healthcare, and food security status. Participants (n=250) were stratified by perceived health status (poor/fair; good/very good/excellent). We investigated unadjusted associations between perceived health status and self-efficacy (0-4), and prevalence of health behaviors, and medical conditions.

Results: The sample was 71.3% female, 53.4% white/Caucasian, 38.1% African American, 3.2% Latino/Hispanic with a mean age of 45.3. The prevalence of a "negative" health perception (poor/fair) was 52%. The negative health perception cohort presented with higher rates of chronic disease including hypercholesterolemia (34%), hypertension (56%), overweight/obesity (48%), and diabetes (22%). Those with a positive health perception reported greater self-efficacy related to making health care decisions, altering behaviors to impact disease management, and improving one's own health status; however, they were also more likely to indicate they were making health behavior changes to address their chronic disease.

Conclusions: These findings indicate that diagnosis of chronic health conditions and co-morbidities in food pantry clients may be associated with negative health-perceptions and

lower levels of self-efficacy. This study provides preliminary evidence that perceived health status may be a useful indicator for screening high-risk individuals within food pantries.

INTRODUCTION

Vulnerable Americans turn to food pantries and other emergency programs for food assistance, yet supplemental foods often fail to meet basic dietary needs (1-2). In addition, these citizens are often faced with competing fiscal demands. A recent study in Central Ohio reported that 40% of food pantry clients are often faced with choosing between purchasing foods and paying for medical care (Spees, unpublished). Over time, these behaviors may lead to poorer health outcomes and progression of existing disease (1,3).

Food insecurity is a recognized risk factor for health disparity in the United States. The majority of food pantry clients are food insecure (4). The 2010 Hunger Study, which drew data from over 60,000 interviews from individuals receiving emergency food assistance, revealed that approximately 30% of participant households had one or more members with poor health (5). Approximately 46% of the total participants nationwide, and close to 52% from Ohio reported that their own health was either fair or poor (5). Other studies have associated food insecurity with high rates chronic diseases such as obesity, type-2 diabetes (T2DM), and cardiovascular disease (CVD) (6-8). Recent data published by USDA's Economic Research Service estimated that 17.6 million households (14.5%) in the U.S. experienced food insecurity in 2012, confirming that little has changed since 2008, and that this issue continues to pose a significant public health concern (4).

Beyond fiscal barriers, socioeconomic inequality may also impede the adoption of health-promoting behaviors. Various health-related behavior studies have linked socioeconomic

status (SES) to the attainment of psychosocial resources (e.g., optimism, personal control, coping style, sense of meaning, and self-efficacy) (3,8,9). Education level, income, and support networks have all been associated with the development of strong psychosocial resources. Individuals with higher functioning psychosocial resources are shown to have better health outcomes (7). Psychosocial resources may influence self-perception, the result of acquired awareness or understanding of one's environment. The way in which we perceive ourselves can also have a direct impact on motivation, and therefore behavior. This suggests that the examination of self-perception and its relationship to factors that contribute to health behaviors may provide a better understanding of the abilities and barriers of individuals living in vulnerable populations.

This study documents the prevalence of positive and negative health perceptions, and explores the relationships between perceived health status and chronic disease prevalence, self-efficacy, knowledge, and health behavior among food pantry clients in Central Ohio. Our goal is to define and characterize this vulnerable population to inform future interventions designed to reduce food and health disparities in food pantries.

METHODS

Data Collection

We analyzed data from one-on-one interviews (n=250) conducted in five food pantries in Central Ohio to represent the clients served by emergency food programs (11). The study comprised a purposive sample of food pantries serving five different geographic areas. Inclusion criteria included English-speaking adults (≥18 years) that were eligible to shop at

the food pantry. A convenience sample of clients was recruited from August 2012 to May 2013.

A comprehensive questionnaire was developed by a team of survey design professionals and based upon a mix of new and validated questions. The survey was divided into five sections in relation to the question content: (1) demographics; (2) health status; (3) concordance to health guidelines; (4) barriers to food access; and (5) food security. To determine perceptions of health, the following question was asked: "In general, how would you describe your own health". Self-reported perceived heath status was stratified as negative ("poor/fair") or positive ("good, very good, or excellent") based upon response. Branched logic was utilized for health knowledge and behavior specific to self-reported health conditions (Appendix). An affirmative response for diabetes, hypertension, hypercholesterolemia, and overweight or obesity triggered the question, "Do you know of any lifestyle or dietary changes to help manage your disease?" If the individual answered, "yes" to this question, they were classified as "having knowledge." Answering "yes" also triggered another question, which asked, "Have you made changes to help you manage your disease?" Answering, "yes" to this question classified them as "taking action."

Ten Ohio State University undergraduate students whom were faculty-trained in the areas survey methods targeting vulnerable populations conducted data collection. The average length of interview was 20 minutes. All names of individuals and locations were omitted to protect participant confidentiality. Data were uploaded directly into REDCap (Research Electronic Data Capture, Vanderbilt University, 2004), a secure online data collection tool. Audio backup was recorded using 2007-2009 Pulse and 2010 Echo Audio Smart Pens (both

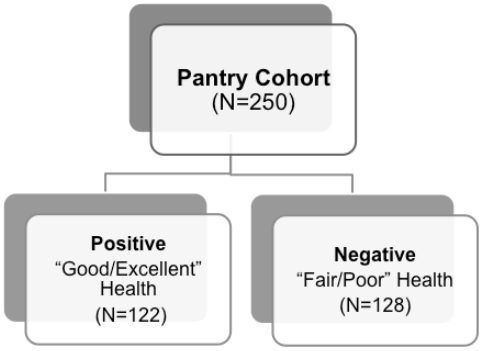
Livescribe Inc., Oakland, CA). Upon completion of the interview, participants received a $10 gift card. Informed consent was obtained from each participant and the study protocol was approved by the OSU IRB.

Statistical Analysis

Responses to the survey questions were coded for tabulation and analysis using SPSS v20 v20 (Version 20.0, IBM SPSS Inc., Chicago, IL) and stratified by negative and positive health perceptions. Self-efficacy was evaluated with a 5-point Likert scale (0-4). Frequency and Chi Square analyses were conducted to determine differences in self-reported health conditions, self-efficacy, and health knowledge specific to health condition vs. behavior change by perceived health status. Because branch logic was utilized to collect health knowledge and behavior data specific to self-reported disease, it was necessary to analyze these characteristics by perceived health status for each condition separately. The results for knowledge and behavior by perceived health status were analyzed per health condition.

RESULTS

Fifty-two percent (n=128) of participants were categorized into the "negative" health perception category and 48% (n=122) in the "positive" health perception group. Those with a negative health perception were more likely to present with hypercholesterolemia (34%), hypertension (56%), overweight/obesity (48%), and diabetes (22%) (Table 1). A significant correlation was noted between positive health perceptions and higher levels of self-efficacy (p=0.003,



0.018, 0.032, 0.069). The lowest level of self-efficacy was evident in respect to changing current behaviors or activities or attitudes to improve overall health in both the positive and negative groups (mean=3.2, 3.0, respectively, Table 2).

Participants with hypercholesterolemia in the negative perception group had higher rates of "having knowledge" (77%) and "taking action" (72%) than those with hypercholesterolemia in the positive perception group ("having knowledge"= 61%, "taking action= 48%). The results for hypertension followed an opposite pattern (Negative: "having knowledge"= 73%, "taking action=62%; Positive: "having knowledge"=74 %, "taking action= 68%). In the case of overweight/obese, both the positive and negative group reported nearly the same rate of "having knowledge" (Negative = 84%, Positive=83%), yet the positive perception group had a greater rate of "taking action" (77%). Those with diabetes in the positive perception group reported "having knowledge" (100%) and "taking action" (Negative: "having knowledge"= 86%, "taking action= 75%).

Table 1. Chronic disease prevalence by perceived health status

Disease	**Negative** (F,P)	**Positive** (E,VG,G)	**Total***
Diabetes	22%	8%	15%
Hypertension	56%	26%	41%
Hypercholesterolemia	34%	19%	26%
Overweight/obese	48%	28%	38%

Abbreviations: F= Fair; P=Poor; E=Excellent; VG= Very Good; G= Good
***** Proportion of total pantry cohort (n=250)

Table 2. Self-efficacy by perceived health status

Question**	**Negative** (F,P)	**Positive** (E,VG,G)	**Total***
… make decisions about what is best for your health?	3.2	3.5	3.4
… find ways to treat a health problem?	3.0	3.3	3.1
… make decisions about medical screenings, treatments, or disease management?	3.0	3.3	3.2
… change your current behaviors or activities or attitudes to improve your overall health?	3.0	3.2	3.1

Abbreviations: F= Fair; P=Poor; E=Excellent; VG= Very Good; G= Good
***Mean for total pantry cohort (n=250)

**** Self-efficacy question introduction: "*How confident are you in your ability to…"*

Table 3. Knowledge vs. behavior by perceived health status

	Negative (F, P)		**Positive** (E, VG, G)	
Disease	**Knowledge**	**Action**	**Knowledge**	**Action**
Diabetes	86%	75%	100%	100%
Hypertension	73%	62%	74%	68%
Hypercholesterolemia	77%	72%	61%	48%
Overweight/obese	84%	61%	83%	77%

Abbreviations: F= Fair; P=Poor; E=Excellent; VG= Very Good; G= Good
• *"Knowledge"* – The proportion of those who answered, "yes" to "Do you know any lifestyle or dietary changes to help manage your disease"
• *"Action"* – The proportion of those who answered, "yes" to having knowledge, and have also adopted those behaviors
- Corresponding dietary/lifestyle change choice for each condition: T2DM – Reduce carbohydrate; HTN – Reduce sodium; Hypercholesterolemia- Eat less fat/different type of fat; Overweight/obese- Increase physical activity

DISSCUSSION

Self-reported perceived health status (SRH) is a subjective measure that is often used to assess health in specific populations. Although it has been documented that health

perceptions are a valid predictor for adverse health outcomes, the predictive power of SRH may be more accurate in populations with higher education and income (12-13). Although our sample was mainly food insecure with low SES and lower education levels than national means, we found that SRH aligned with conditions and behaviors that often present with accompanying symptoms that may affect health perceptions. Although our stratification resulted in cohorts that we divided almost equally, approximately 28% of the participants reported no known chronic conditions. This finding indicates that disease diagnosis may not independently influence health perceptions. As documented in other studies (14-15), uninsured and low SES populations often live with undiagnosed and unmanaged disease for longer periods prior to seeking treatment.

A positive correlation was found between self-efficacy and perceived health status in this cohort (statistical significance for each of the four self-efficacy questions: $p=0.003$, $p=0.018$, $p=0.032$, $p=0.069$). Self-efficacy is a major construct in health-behavior theories, and this finding reinforces a possible connection with optimism and well being. The one self-efficacy question that received the lowest score in both health perception groups was, "How confident are in your overall ability to change your current behaviors or activities or attitudes to improve your overall health?" The lower score across both groups for the question related to behavior change and may imply barriers to success relating to actionable behaviors impacting overall health. Those seeking provisions from a food pantry are often focused on meeting basic primal good needs. The thought of immediate changes required to impact long-term health needs may be of low priority.

A significant proportion of our total food pantry cohort (21%) was categorized as food secure. It is important to keep in mind that the intent of emergency food assistance programs is to increase food security. Therefore, it is reasonable to assume that the proportion of those categorized as food secure might become food insecure if their safety net food programs were decreased or unavailable.

The original study design did not include statistical analysis of the participants who reported having no chronic health conditions by perceived health status. We decided to explore this data found that 17.2% (n=22) of those without a chronic disease diagnosis had a negative perception of their health. This finding further indicates that disease diagnosis may not independently influence health perceptions and there may be other unidentified factors and/or barriers affecting perceptions of health status that are unrelated to known health conditions.

We also decided to explore SRH trends across demographic subpopulations. Previous studies suggest that gender and race affect how people respond to SRH questions. Specifically, the literature has shown that women and African Americans consistently report poorer health status (14-16). The underlying cause of these outcomes is not completely understood, but poorer SRH in these two groups may be related to the higher prevalence of depression among women, and generations if discrimination toward African Americans leading to less optimism related to health (14). Consistent with much of the previous research, our findings show that of those with negative health perceptions in our cohort a majority were African American (52%) and female (73%).

This study had several limitations. The targeted food pantries were intentionally selected, so the results may not be fully generalizable. In addition, convenience sampling may have resulted in an inaccurate representation of the food pantry population. Although trained personnel administered the surveys, inherent survey bias may have existed. There is also no guarantee that every participant fully understood or interpreted all questions as intended. Because the knowledge and behavior analysis do not take "correct" vs. "incorrect" answers into account, our results do not give us an accurate picture of health literacy in this population. The varied outcomes for knowledge and behavior between reports of chronic disease may be the result of subjects reporting multiple comorbidities and confusing diet-related recommendations. Differences may exist in the way in which knowledge was acquired and personal motivation to engage in health-promoting behaviors. Further research is required in order to make any conclusions.

CONCLUSION

Data obtained from this study contributes to the understanding of the abilities and barriers of food pantry clients, and provides preliminary evidence that perceived health status may serve as a useful indicator for screening high-risk individuals. These data highlight the need to design and implement targeted interventions to screen, identify, and treat disease in underserved populations. Food pantries are a significant access points for implementing health care interventions designed to reduce the public health burden.

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Appendix

[ONLY IF PARTICIPANT REPORTS CONDITION] You mentioned earlier that you have been told you have [CONDITION]. Do you know about any health and lifestyle changes that can help you control your [CONDITION]?

o Yes

o No

o I don't know

o I prefer not to answer

[IF YES] What are some of the dietary and lifestyle changes that you can make to help you control your [CONDITION]? (DO NOT READ OPTIONS, check all responses stated)

o Stop/reduce smoking

o Lose weight

o Increase physical activity/Exercise more

o Reduce sodium/salt

o Reduce dietary cholesterol/bad fats

o Eat more fiber/whole grains

o Reduce carbohydrates/sugars

o Get more sleep

o Drink more water/drink less sugar sweetened beverages

o Reduce stress

o Eat less fat/eat different type of fat

o Other_____

o I prefer not to answer

[IF ANY changes are noted above, ask] Have you made any of these changes to help control your [CONDITION]?

o Yes

o No

o I don't know

o I prefer not to answer

[IF YES] What health and lifestyle changes have you made to help you control your [CONDITION]? (DO NOT READ OPTIONS, check all responses stated below)

o Stop/reduce smoking

o Lose weight

o Increase physical activity/Exercise more

o Reduce sodium/salt

o Reduce dietary cholesterol/bad fats

o Eat more fiber/whole grains

o Reduce carbohydrates/sugars

o Get more sleep

o Drink more water/drink less sugar sweetened beverages

o Reduce stress

o Eat less fat/eat different type of fat

o Other_____

o I prefer not to answer

[IF NO] What has stopped or prevented you from making this/these

change(s)?

_____

[IF PARTICIPANT REPORTS CONDITION] When you shop at the pantry, do you specifically look for foods that may help you manage your [CONDITION]?

o Yes

o No

o I don't know

o I prefer not to answer

[If YES] What types of foods do you look for to help you control your [CONDITION]? (DO NOT

READ OPTIONS, check all responses)

o Reduced carbohydrate

o High fiber

o Whole grain

o Fruits/Vegetables

o Low fat

o Low sodium

o Low cholesterol

o Low calorie

o Other _____